CASE REVIEW:
NEGLIGENCE IN THE EMERGENCY DEPARTMENT MANAGEMENT OF CHEST PAIN, PART ONE

By RICHARD R. GRANVILLE, M.D., J.D.

The management of the patient with chest pain in the emergency department continues to be one of the most serious medical-legal problems facing the emergency physician. The failure to diagnose myocardial infarction, coupled with the failure to admit the patient for the suspicion of a cardiac event, constitute a total of approximately 11 percent of closed claims in emergency medicine according to a recent study surveying 694 emergency department claims at the Department of Legal Medicine, Armed Forces Institute of Pathology (AFIP). These claims, of course, alleged negligence by health care providers at military medical facilities, but the civilian experience is similar. A comparable study conducted by the American College of Emergency Physicians found missed myocardial infarction to account for 10 percent of emergency medicine malpractice cases.[1] The following case is illustrative of the patterns seen in cases involving the failure to diagnose myocardial infarction.

A 46-year-old female presented to the emergency department at 0355 hours on 13 July. She complained of chest pain, shortness of breath, nausea and vomiting. She had experienced some congestion for the previous week and on the day of evaluation felt restless and had trouble falling asleep. Her husband had noted that her respirations seemed noisy. At home, she awoke, had vomiting and diarrhea and then felt somewhat better. In the emergency department, a short time later, her vital signs were normal and physical examination was unremarkable. No further evaluation or diagnostic studies were performed. A diagnosis of "upper respiratory infection or gastroenteritis" was recorded on the chart. She was released in good condition and told by the emergency department physician, who, incidentally was in his first month of postgraduate training, to take fluids and to rest. She left the hospital at 0450 hours and was last seen alive by her husband at 1030 hours and found dead at 1145 hours on the same morning. An autopsy revealed the presence of coronary atherosclerosis, and there were findings suggestive of an acute myocardial infarction which was one to two days old.

The claimants filed a medical malpractice claim in the amount of $1,550,000, alleging negligence by the personnel of the emergency department resulting in the death of the patient. This case was settled for $275,000.

This case, taken from the AFIP repository of approximately 5,300 malpractice cases, demonstrates that the documentation regarding an adequate chest pain history is an important factor in the ability to defend, or the need to settle, a malpractice suit. Either the brief history and evaluation provided an incomplete factual basis upon which to base a reasonable discharge decision, or historical information which suggested the possibility of a cardiac event was ignored. Until now, such conclusions have been primarily based on anecdotal evidence. In conjunction with this research, the Department of Legal Medicine has collated and analyzed all such cases in its files related to the misdiagnosis of myocardial infarction in an outpatient setting, and has discovered a pattern indicating that the recordation of incomplete patient histories, coupled with inadequate diagnostic work-ups and consequent decisions based on incomplete data bases, are prone to result in either the settlement of that case or an adverse verdict at trial.

As previously stated, failure to diagnose myocardial infarction is one of the more frequent medical malpractice claims involving emergency physicians, representing approximately 10 percent of all emergency medicine claims.

This ongoing Department of Legal Medicine study represents a major medical-legal research effort funded by a $200,000 grant from the Robert Wood Johnson Foundation. In the initial phase of the study, summarized

in this article, an analysis of actual emergency medicine malpractice cases involving the failure to diagnose myocardial infarction was performed. An effort was made to identify the specific errors which occur in the emergency department setting, resulting in the failure to either diagnose myocardial infarction or admit for suspicion of a cardiac event. It is hoped that, through analysis and understanding of these cases, the number of malpractice claims and subsequent suits with resultant payment can be minimized in the future.

The study is proceeding from certain basic tenets in medicine and law which, applied properly to the evaluation of the chest pain patient, should succeed in providing a significant degree of protection for the physician. First, it is well known that a detailed and meticulous history of the character and nature of chest pain is an important method in the ambulatory setting for determining the cause and possible cardiac nature of chest pain. Certainly, the electrocardiogram is very important tool and will be used in the evaluation of most cases of chest pain, but it must be remembered that a normal electrocardiogram does not rule out an ischemic cause for the pain[2,3]

Second, physicians do not guarantee a good outcome in every case, and the law does not demand that they achieve a favorable result. While they do not guarantee that they will make the correct diagnosis, however, they must perform an appropriate evaluation of the patient, and in most instances this entails a detailed history, some degree of physical examination and an electrocardiogram for many chest pain patients. It is also understood that not all cases of myocardial infarction or ischemic pain will be detected even with appropriate evaluations. In a recent prospective multicenter investigation of emergency department patients with acute chest pain, for example, of those patients who actually suffered a cardiac event, physicians admitted 96 percent of patients who were later documented to have suffered a myocardial infarction and discharged the remaining 4 percent who also were subsequently found to have suffered a myocardial infarction.[4]

Third, both in the administrative phase and in litigation, the standard of care is determined by expert witnesses consisting of physicians in appropriate specialties who attack the completeness of the medical record. It is relatively easy for a trained physician to attack an emergency department charge which contains a very incomplete history regarding chest pain. Decisions as to whether to settle or defend a given case are based upon the opinions of these expert witnesses. A recorded, detailed history which presents a reasonable factual basis for the decision to discharge a patient with chest pain is crucial to the successful defense of a case.

From the files of malpractice cases at the Department of Legal Medicine, Armed Forces Institute of Pathology, 71 outpatient visits to various ambulatory care facilities were identified which involved the failure to either diagnose myocardial infarction or admit to the hospital on the basis of suspicion of a cardiac etiology. The cases occurred in a period that extended from 1978 to 1987. The following descriptive data summarize some of the initial findings.

Table 1 indicates the time of day which was recorded on 52 of 71 visits. Approximately 46 percent of cases occurred during the day shift, 29 percent of cases occurred during the evening shift, and 25 percent of cases occurred during the night shift.

Figure 1 (next page) indicates the months of the year in which 71 of these visits involving the misdiagnoses of a myocardial infarction occurred.

TIME OF DAY
N=52

SHIFT	NUMBER	PERCENT
0700-1500 Day	24	46
1500-2300 Eve	15	29
2300-0700 Night	13	25

TABLE 1

Table 2 (next page) indicates the recorded discharge diagnoses for patients who subsequently suffered cardiac events. Not unexpectedly, gastrointestinal diagnoses predominate on this list, and some patients carried more than one diagnosis.

MONTHS OF THE YEAR
N=71

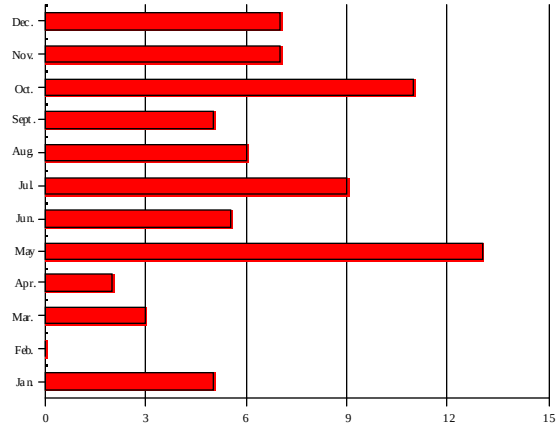

FIGURE 1

Table 3 represents a comparison of the total number of historical items recorded in these 71 charts, and in Table 4 (next page) the frequency with which each item of information was recorded on the medical record is listed. A chest pain history, of course, can be very detailed and include twenty or more items of specific historical information when one includes such factors as associated symptoms and risk factors.

Interestingly, in this analysis, 87 percent of the records contained fewer than ten historical items of information. There was actually an average of five historical items of information per emergency department record. Significantly, important features in the historical evaluation of the patient such as location of pain, character of pain, radiation of pain, and duration of pain were documented in only about half of the cases. Comments about the presence or absence of a past cardiac history were recorded in 20 percent of these emergency medicine malpractice cases. In general, many important historical items either are not collected or, if collected, are not recorded.

DISCHARGE DIAGNOSES
N=78

DISCHARGE DIAGNOSIS	NUMBER
Hiatal Hernia, Reflux Esophagitis, Spasm	18
Peptic Ulcer/Pancreatitis	7
Rule out Ischemic Hearth Disease/Angina	5
Gastritis	4
Gallbladder Disease	4
No Diagnosis	4
Doubt Cardiac Etiology, Non-Cardiac Pain	4
Chest pain/Atypical Chest Pain	3
Chest Pain ? Etiology	3
Costochondritis	3
Viral Cold/URI	3
Bronchitis/Pneumonia	3
Epigastric Pain/Abdominal Gas	3
Muscle Spasm	2
Osteoarthritis	2
Hypertension	2
Heartburn	2
Chest Wall Pain/Radiculopathy	2
Chest Pain-Gastrointestinal Etiology	1
Chronic Obstructive Pulmonary Disease	1
Hyperventilation	1
Gastroenteritis	1

TABLE 2

HISTORICAL ITEMS DOCUMENTED
N=71

HISTORICAL ITEMS	CHARTS	PERCENT
0-4	36	50
5-9	26	37
10-14	7	10
15-19	2	3
20-24	0	0
25-29	0	0

TABLE 3

Many of these items, such as prior history of angina or myocardial infarction, duration of pain, similarity to previous pain, radiation, character of pain and comparison to prior angina or myocardial infarction, found absent on these 71 study charts involving malpractice cases, are items currently used in standard protocols or algorithms to identify those at risk for myocardial infarction and to properly triage patients with atraumatic chest pain.[5] Additionally, the newest American College of Emergency Physicians' Clinical Policy on Chest Pain incorporates many of these historical items as key areas to be included in the history taken from patients presenting with atraumatic chest pain.[6] The frequent omission of these historical items from the malpractice charts appears to represent a pattern of incomplete data collection prior to a decision to discharge the patient.

HISTORICAL FACTS RECORDED

	CHARTS	PERCENT		CHARTS	PERCENT
Location of Pain	42	59	Relief with NTG	6	8
Character	37	52	Diabetes Mellitus	6	8
Radiation	37	52	Frequency/Pain	5	7
Duration	35	49	Pain at Rest	4	6
Shortness of Breath	25	35	Palpitations	4	6
Diaphoresis	23	32	Family History/CAD	4	6
Nausea	14	20	First Episode Described	3	4
Cardiac History	14	20	Change in Severity/Frequency	3	4
Exertional	12	17	Pain same as Prior MI	3	4
Relieved By	11	15	Pleuritic	2	3
Vomiting	9	13	Relief with Antacids	2	3
Aggravated By	9	13	Lipids	2	3
Occurs at Rest	9	13	Dizziness/Syncope	2	3
Hypertension	9	13	Orthopnea	1	1
Tobacco Use	8	11	PND	1	1
Relief at Position Change	6	8	Edema	0	0

TABLE 4

Concerning the physical examination and laboratory tests, our survey of the charts indicates that a cardiac and pulmonary examination both were performed in 72 percent of cases and an electrocardiogram was performed in slightly more than 50 percent of the cases. Interestingly, the electrocardiogram, when performed, was misread in nearly one-quarter of these cases. Consultation with the Medical Officer of the Day prior to discharge was obtained in 8 percent of cases. (Table 5)

PHYSICAL EXAMINATION AND ELECTROCARDIOGRAM
N=71

	CHARTS	PERCENT
Cardiac & Pulmonary Exam	51	72
EKG Performed	38	54

TABLE 5

Concerning the outcome of patients, available information indicates that subjects died in 80 percent of cases, and suffered a delayed diagnosis of a myocardial infarction with some impairment in 20 percent of cases. Figure 2 indicates the known payment range in paid cases with approximately 50 percent of the cases resulting in a payment between $1 and $100,000. Thirty-five percent of the cases resulted in a payment between $100,000 and $200,000, and 15 percent of the cases resulted in payment between $200,000 and $300,000.

This information suggests that the defense of medical malpractice suits involving a failure to diagnose

SETTLEMENTS
(RANGE: $1,200-$275,000)

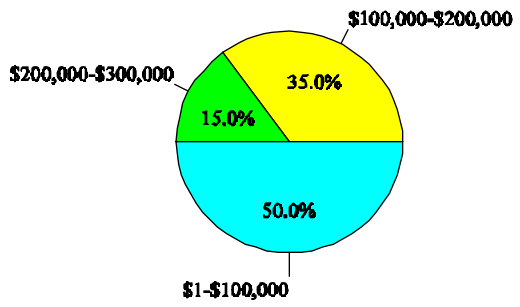

FIGURE 2

myocardial infarction in the emergency department is hampered by the utilization of relatively incomplete and inadequate medical records concerning the medical history, physical examination and electrocardiogram interpretation. Certainly, without adequate documentation of many of the historical facts required in a chest pain history, the defense of any malpractice suit involving the discharge of a patient from the emergency department who subsequently suffers a myocardial infarction becomes much more difficult and is more likely to result in payment.

This initial part of the study then demonstrates that there is often an apparent deficiency in recordation of sufficient historical items to provide an adequate defense when a malpractice suit arises in the military sector. Since the reasonableness of the discharge decision is the issue, sufficient detail is necessary in the medical record to demonstrate that the patient was carefully evaluated and that his history and objective diagnostic tests did not provide sufficient suspicion to hospitalize him on the basis of a possible cardiac etiology.

In subsequent articles, the latter phases of this project will be reviewed, to include the results of a questionnaire which randomly surveyed current charting practices and comparison of the historical items contained on these malpractice charts with random charts documenting emergency department visits for chest pain. The goal is that analysis of these malpractice cases, along with comparison with other charts, will suggest ways in which attention to history-taking and recordation can significantly enhance the defensibility of physician-patient encounters.

Below are two Supplementary Cases from the Emergency Department Chest Pain Study.

SUPPLEMENTARY CASES FROM THE EMERGENCY DEPARTMENT CHEST PAIN STUDY

CASE 1

A 52-year-old female presented to the emergency department on 8 August at 1143 hours, complaining of constant chest pain since the previous night. The physician elicited the additional history that the patient had experienced intermittent dull chest pain for two days. There was no radiation of the pain, diaphoresis or shortness of breath, and the patient related that she had been under increased stress and had been tired for the previous week. On physical examination, the vital signs were normal, the throat and ears were clear and the neck was supple. Auscultation of the chest revealed rhonchi and questionable rales in the right upper lobe area. Cardiac examination revealed a regular rate and rhythm with a barely discernible systolic ejection murmur at the apex. Abdominal examination was unremarkable and the extremities had no clubbing, cyanosis or edema. The chest radiograph revealed a minimally enlarged heart probably due to a pectus deformity. The complete blood count was within normal limits, no electrocardiogram was performed, and the assessment written on the chart was that the patient had chest pain of unknown etiology. She was released in stable condition and told to take a non-steroidal anti-inflammatory drug as needed for pain. In addition, she was to rest and see her personal physician several days later.

Apparently, the patient returned home and began to mow her lawn. She then entered the house, where her husband later found her on the floor gasping for breath. The ambulance arrived and the attendants noted dilated pupils. Cardiopulmonary resuscitation was initiated and she was brought to the emergency

department in fine ventricular fibrillation. She was intubated and received numerous cardiac medications without response, and was pronounced dead. The patient's estate filed a claim in the amount of $500,000, alleging negligence by the emergency physician in failing to perform an electrocardiogram on the patient, resulting in her death. Although no autopsy was performed in this case, it was settled for $100,000.

CASE 2

A 56-year-old male presented to the emergency department on 20 May at 0730 hours. He complained of chest pain accompanied by pain down the posterior aspect of both arms to the elbows. The pain had awakened him that morning, had been intense for three to five minutes and was accompanied by back pain. His vital signs were normal, his cardiac examination revealed a regular rate and rhythm and his lungs were clear to auscultation. An electrocardiogram revealed no significant Q waves or S-T segment abnormalities. The recorded assessment was "muscle spasm/anxiety." He was prescribed oral Valium tablets and instructed to return as needed. On 26 May the patient presented to a civilian hospital in full cardiac arrest and was pronounced dead. No postmortem examination was conducted. The medical malpractice claim in the amount of $2,000,000, alleging negligence by the emergency room physicians, was settled for an amount in excess of $200,000.

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